Covid Economics: Who should get it first? Public preferences for distributing a COVID-19 vaccine.

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Who should get it first? Public preferences for distributing a COVID-19 vaccine[1]

Jeroen Luyten,[2] Sandy Tubeuf[3] and Roselinde Kessels[4]

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Once a safe COVID-19 vaccine will become available, there will not be enough supply of it to vaccinate the entire population. Policy makers at national and international level are currently developing vaccine prioritization strategies. However, it is important that these strategies have sufficient levels of public support. We conducted a ranking exercise and a discrete choice experiment on a representative sample of 2,000 Belgians in order to elicit their preferences regarding how to distribute the COVID-19 vaccine across the population. We identified that three sub-groups had similarly high levels of support for access priority: the chronically ill, essential professions, and individuals likely to spread the virus the most. We identified two clusters of respondents. While both wanted to vaccinate essential professions, cluster one (N=1058) primarily wanted to target virus spreaders whereas cluster two (N=886) wanted to prioritize the chronically ill. Prioritizing those over 60 years of age was remarkably unpopular. Other strategies such as allocating the vaccine using a 'lottery', 'first-come, first-served' approach or willingness-to-pay received little support. Public opinion is a key variable for a successful engaged COVID-19 vaccination policy. A strategy simultaneously prioritizing medical risk groups, essential professions and spreaders seems to be most in line with societal preferences. When asked to choose, people agree to vaccinate essential professions but disagree whether to prioritise people with high-medical risk or virus spreaders.

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1 This study did not fall under the Belgian law on experiments as anonymized data collected by a third party were analysed and the Social and Medical Ethics Committee (SMEC) of KU Leuven decided that no approval was needed.
2 Professor of Health Economics, KU Leuven.
3 Professor of Health Economics, UCLouvain.
4 Professor of Statistics, Maastricht University.

1. Introduction

After months of a global public health crisis, vaccines that are safe and effective in providing protection against the SARS-CoV-2 virus are expected to arrive (Mallapaty and Ledford 2020, Bloom, Nowak, and Orenstein 2020). Once available, a new challenge will emerge: their initial supply will be limited due to various production, logistic and regulatory constraints (Usher 2020, Khamsi 2020, Phelan et al. 2020). In the first stages, it will be inevitable to make tough choices regarding how to distribute the vaccine over the population and it is expected that not all who could benefit from it will be able to be vaccinated (Subbaraman 2020, Schmidt 2020, Schmidt et al. 2020, Emanuel, Persad, Upshur, et al. 2020, Roope et al. 2020). The decision who should get vaccinated first needs to be prepared well in advance, in order to make sure that rationing of a life-saving product goes as fairly and smoothly as possible. Experts organisations such as the World Health Organisation (WHO) Strategic Advisory Group of Experts (SAGE) on Immunisation, the National Academies of Sciences, Engineering, and Medicine (NASEM), the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP) and more recently the European Commission (EC), have already issued guidelines regarding COVID-19 vaccine allocation and prioritisation strategies (Gayle et al. 2020, European Commission 2020, World Health Organization 2020). They have all identified subgroups of the population that should be prioritised for vaccines while manufacturers scale up production. The priority list includes the front-line health care workers, the highest risk categories - those above 60 years old or with coexisting conditions, people with an essential work, people who live in crowded settings and in higher risk environments. While the WHO and EC guidelines explicitly have stated that the identified groups are not ranked in order of prioritisation, NASEM has suggested a phased vaccines allocation where priority is guided by risk-based criteria.

A key difficulty in finding a fair allocation of the COVID-19 vaccine will be to reconcile at least three objectives: to protect the medically worst-off, to protect public health, and to protect the economy and society functioning (Emanuel, Persad, Upshur, et al. 2020, Roope et al. 2020, Persad, Peek, and Emanuel 2020, Liu, Salwi, and Drolet 2020). Each of these objectives point at different target groups of the population to prioritise when distributing the vaccines. For example, one could prioritize those at most risk of developing severe forms of COVID-19: those with comorbidities and weak immune systems in which a COVID-19 infection is most likely to be fatal, and older people with higher mortality odds (Clark et al. 2020). Whereas this strategy will perform best in reducing the short-term disease burden, vaccinating medically vulnerable groups does not necessarily do best in containing virus transmission, especially if vulnerable groups are already self-protecting and avoiding contacts. From a public health perspective, vaccination of the individuals that are most important in the transmission of the virus within society would be most effective in controlling COVID-19 contagion and could indirectly translate into lower casualties amongst vulnerable groups (Wang et al. 2020, Adam et al. 2020). Similarly, essential

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professions could be vaccinated first in order to minimize the social impact of the virus. In the first place, this would apply to healthcare workers (The Lancet 2020), whose protection is essential to avoid implosion of the health system but, by extension, other professions essential to society's normal functioning could be targeted for vaccination. Finally, in order to mitigate further damages to already weakened economies, it might be a priority to vaccinate first the people who are most important to the economy, especially those who would cost more to society if they cannot keep working. Beyond specific population sub-groups, other strategies that have been suggested in the allocation of scarce medical resources, could be considered (Persad, Wertheimer, and Emanuel 2009, Emanuel, Persad, Kern, et al. 2020, Persad, Peek, and Emanuel 2020). One could give everyone an equal chance to get a vaccine using for instance a lottery. One could also distribute the vaccine on a 'first-come, first-served' basis as it is sometimes done in other policy domains such as allocation of social housing. Eventually, access to a vaccine could be granted using people's willingness-to-pay as it is done in a market system where the amount people are willing to pay would reflect the personal value they attribute to being vaccinated.

All these alternative strategies have their own rationale to allocate the limited supply of COVID-19 vaccines. It is far from obvious which specific mechanism is deemed most appropriate and most supported. Given the major collective dimension of the current crisis, the expected value of a vaccine and the turmoil that scarcity of it might instigate, it is important to understand which vaccines allocation mechanism seems the most acceptable to the public. Furthermore, as has already been evidenced with other measures (e.g physical distance, mouth masks, etc.) public support plays a crucial role in making pandemic countermeasures effective.

In this article, we present the results of a study carried out on a representative sample of the general population in Belgium. We asked members of the public first to rank different specific population groups by order of priority to access COVID-19 vaccines and then to state their preferences over multiple pairs of hypothetical individuals for priority allocation.

2. Methods

2.1. Sample and survey

We used a nationally representative panel of the market research agency SSI to complete a survey in between 6 and 16 October 2020. From a panel of 5,500 selected members that mirror the Belgian population as well as possible[1], a sample of N=2,060 was drawn randomly, fulfilling pre-determined Belgium quota for age, gender, level of education and province.

[1] The research company evaluates it continuously, eliminates low-quality responders systematically and participation is rewarded with bonus points that lead to vouchers to buy certain products or make donations.

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The survey first asked for a range of respondent sociodemographic characteristics along with their financial situation, general self-assessed health, attitude towards vaccination and toward the government's dealing with the corona crisis, whether they had had COVID-19, whether someone they knew had it, was hospitalized because of it and had died because of it. Respondents were also asked whether their profession was among the 'essential professions' (i.e. those that were obliged to keep working during the first 'lockdown' in March/April 2020) and whether they considered themselves to be part of a risk group for COVID-19 and if so, which group they belonged to (old age, chronic illness, obesity, or other). The questionnaire was then followed with an explanation of the background to the study where we explicitly asked the respondents to think about what they considered the fairest to society when allocating the limited supply of COVID-19 vaccines, and not to choose simply what would be the most to their own advantage. After the ranking exercise and the choice experiment, respondents were asked about whom should decide who gets the COVID-19 vaccine first (government, scientists or the population), whether they would choose to be vaccinated themselves once a vaccine becomes available, and how easy they found answering the survey.

2.2. Ranking exercise

We presented the respondents with eight alternative strategies to distribute the COVID-19 vaccines summarized in *Table 1*. Each strategy was presented one after the other using successive new screens that respondents were only able to progress from every 10 seconds. The eight strategies were then summarised as a list in their short version (with the possibility to go back to the full explanation if needed) and respondents were asked to rank all of them from the ''most appropriate' to 'least appropriate' according to their opinion. They were told that the vaccine was equally safe and effective in all people.

Table 1: Eight strategies to distribute a COVID-19 vaccine

Strategy (in short)	**Full explanation as presented in the experiment**
Prioritizing chronically ill	We could first give the vaccine to people who are medically most at risk of serious illness and death because they have another underlying condition: cancer patients, people with lung disease, heart disease, kidney disease, severe obesity, etc. By vaccinating them first, we would protect **the people most vulnerable to the virus**.
Prioritizing the elderly	We could first give the vaccine to people over 60 years old. We know that, on average, these people run a much higher risk of serious illness or death from a corona infection. By vaccinating them first, we would protect **the people most vulnerable to the virus**.
Prioritizing spreaders	We could first give the vaccine to the people who spread the virus the most because they have a lot of social contacts in their daily life (at work, at school, in their neighbourhood, in public transport, etc.). These people themselves are not at high risk of serious illness or death from COVID-19, but they can infect many others. By vaccinating them first, we would **slow down the spread of the virus as much as possible**.

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Prioritizing workers	People who work will cause a greater economic cost when they become ill than those who do not work. By first vaccinating working people, we would ensure that the virus does **as little further damage as possible to the economy**.
Prioritizing essential professions	Some professions are more "essential" to society than others. During the pandemic, health workers, hospital staff, police and garbage services had to continue working as usual, while others had to work from home or were temporarily unemployed. By prioritizing workers from these vital sectors, we would protect the **normal functioning of society**.
Lottery	We could distribute the available vaccines randomly among the population, for example through a lottery. Therefore, each individual would have the **same chance to be vaccinated**, regardless of their health risk or the social impact of an infection.
First-come, first-served	We could distribute the available vaccines to the population according to the principle "**first-come, first-served**". People who present themselves the fastest for vaccination at the doctor, pharmacy or government would be given priority from the moment there is a vaccine.
Market	We could sell the available vaccines to the highest bidder. The people **who want to pay the most money** for a vaccine would be given priority.

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2.3. Discrete choice experiment

We then subjected respondents to a discrete choice experiment (DCE). This is a widely used survey method to study individuals' preferences.(Ryan, Gerard, and Amaya-Amaya 2008, Louviere, Hensher, and Swait 2000) Participants are presented with a series of choice sets, usually between two or more products or services that are described by the same attributes but they differ in their attribute levels. By observing a large number of choices, researchers can infer how attributes and levels implicitly determine the value of the competing options. Here, we presented respondents with a choice between two hypothetical people candidates for COVID-19 vaccination. Both candidates were described with identical attributes, but they differed in terms of the levels of these attributes so that we could infer how important these attributes were to the respondents when prioritizing one or the other candidate for vaccination.

Attributes and levels. The DCE focused on five attributes of people: (1) their age, (2) whether they belonged to a medical risk group due to underlying illnesses, (3) their importance to the economy, (4) whether their profession was considered 'essential', and (5) whether they would spread the virus to many other people or not in case of infection (see *Table 2*). The remaining strategies from the ranking exercise (lottery, market, first-come first-served) were excluded in the DCE.

Table 2: Attributes and levels used in the DCE

Attribute	Levels
Medical risk group	▪ Someone who has no underlying conditions ▪ Someone who has higher risk through chronic illness
Age	▪ Someone who is younger than 60 years ▪ Someone who is at least 60
Virus spreader	▪ In case of infection, someone who is expected to contaminate 1 other person ▪ In case of infection, someone who is expected to contaminate 10 other persons
Cost to society	▪ In case of infection, someone who is expected to cost society 0€ per day ▪ In case of infection, someone who is expected to cost society 100€ per day ▪ In case of infection, someone who is expected to cost society 1000€ per day
Essential profession	▪ Someone who has a profession that is considered 'essential' ▪ Someone who has a profession that is considered not 'essential'

Design. We designed the DCE using "partial profiles": we kept two levels constant between the two choice profiles whereas three levels varied.(Kessels, Jones, and Goos 2015, Kessels et al. 2011) This made the choice tasks easier to perform and therefore more reliable and valid for the analysis. The complete DCE survey consisted of 30 choice sets that we split into three different blocks of 10 choice sets. The three versions were then divided equally among respondents (one representative sample for each survey block). Within each survey, 10 choice sets were presented in a random order to respondents to counteract a possible "order effect". Before the DCE started, we presented the respondents with a mock choice set. This choice set was identical to their last 'real' choice set and allowed us to analyse the consistency in responses. *Figure 1* presents an example of a choice set.

The statistical design (the specific composition of the choice profiles) that we generated was "D-optimal" within a Bayesian framework.(Kessels et al. 2011) This design makes it possible to examine the importance of the attributes and their levels with maximum precision. The complete design of the DCE is presented in *Table A.2*.

We first tested various visualisations amongst a convenience sample (N=10) and then carried out a pilot study of the full survey in 174 respondents. After correcting for a few minor issues, we went ahead with the full launch of the study in 2,060 respondents.

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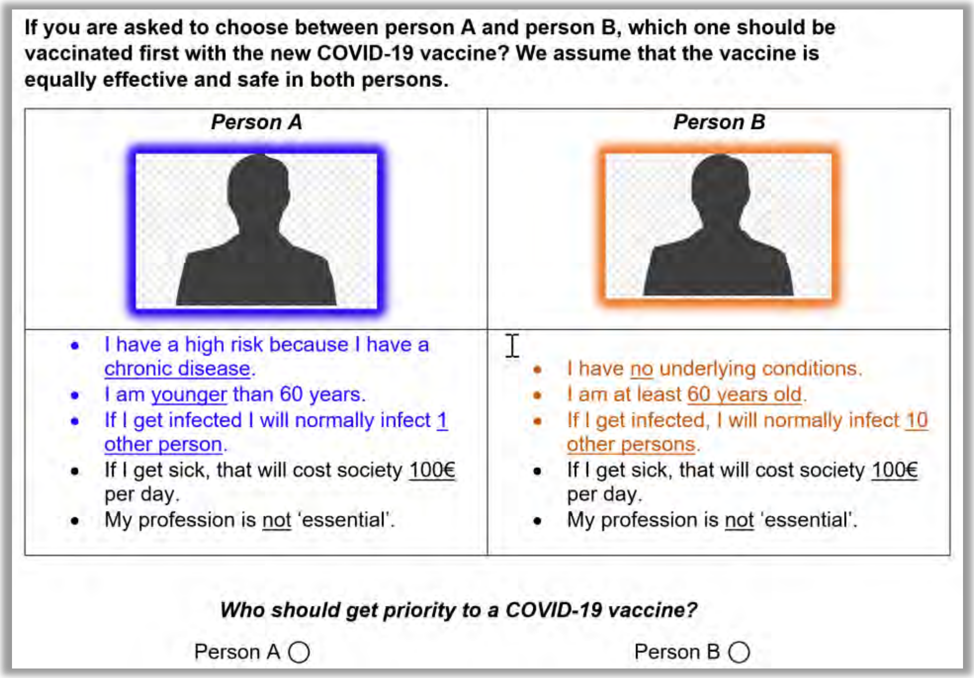
Figure 1: Example of a choice set



2.4. Statistical analysis

We analysed the choice data by estimating a panel mixed logit (PML) model using the hierarchical Bayes technique in the JMP Pro 15 Choice platform (based on 10,000 iterations, with the last 5,000 used for estimation). This model assumes normally distributed utility parameters over the respondents to accommodate unobserved heterogeneity in the respondents' preferences. The mean utility function is thereby the sum of the mean attribute effects. Using Ward's hierarchical cluster analysis on the individual utility estimates, we identified important respondent segments that we characterized through bivariate chi-square analyses on the respondents' covariates and multiple logistic regression with the cluster membership as response variable and the respondents' covariates as explanatory variables. In all our analyses we used a significance threshold of five percent.

3. Results

On average the survey took respondents 21 minutes to complete (median 15.3). When asked how difficult completion of the survey was, only 21 respondents (1%) indicated it was 'too difficult' whereas 1,154 (56%) said it was "easy" and 43% found it "difficult but doable". None of the response distributions nor answers to comment boxes raised concerns to the research team. A sample of 1,577

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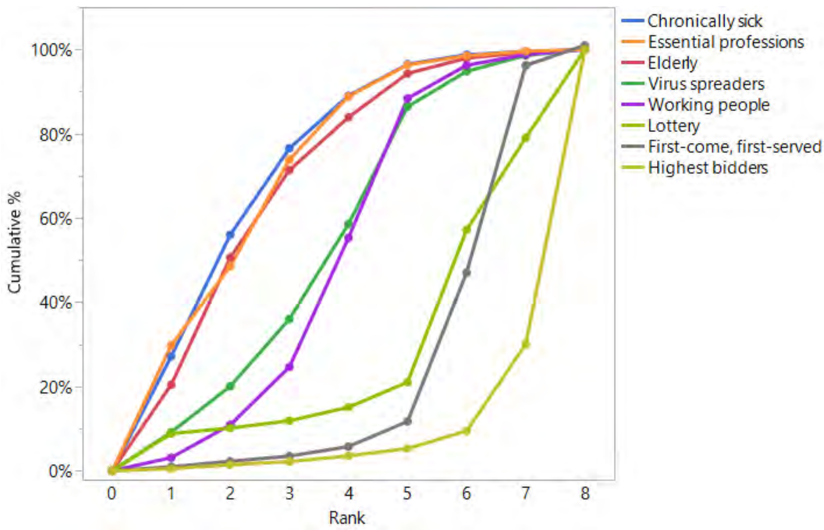
respondents (77%) gave the same answer twice to the repeated choice set, however differing answers do not point at invalid answers as the strength of preferences can be weak in this context. We did observe 116 respondents (6%) that gave the same answer throughout the DCE ('straightliners'). As this is unlikely, we decided to exclude these as a way of caution, leaving us with 1,944 respondents for the analysis.

Thirty-nine percent considered themselves part of a COVID-19 risk group. A small minority (<20%) of the sample had experience with a COVID-19 infection, either in themselves or their proximity. A small majority (59%) was dissatisfied with the government's approach to the crisis. A large majority of respondents (78%) thought that the vaccine allocation decision should ultimately be determined by scientists; 10% thought the government should decide and 12% thought that it should be the population only. When asked whether they would become vaccinated with a COVID-19 vaccine, 74% responded affirmatively (see *Table A.1*).

3.1. Ranking exercise results

The ranking exercise results are summarized in *Figure 2*. We use cumulative distribution functions to synthesize how each strategy was ordered by the respondents. The graphical representation shows that there was not one single strategy that dominated and was considered as absolute best by a large majority.

Figure 2: Cumulative distribution functions of alternative COVID-19 vaccine allocation strategies ranked from 'most appropriate' (rank of 1) to 'least appropriate' (rank of 8)



The eight strategies are clearly divided into three groups: three dominant strategies, two strategies ranked somewhere in the middle, and three strategies ranked in the three worst strategies. Prioritizing

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essential workers, chronically ill and elderly were found to be the three most supported strategies. On the other hand, market, lottery or "first-come, first-served" strategies were clearly the least preferred strategies with at least 80% of the respondents ranking them at the bottom of the ranking. Finally, targeting spreaders or protecting the economy were strategies ranked in the middle.

While the lottery strategy was very unpopular (79% ranked it in the top 3 of worst strategies), one in ten respondents thought that this was a very good strategy and ranked it as the most or second most appropriate strategy for allocating vaccines in the population. Analysing further this group of respondents, we found that the lottery strategy was more attractive to younger respondents (25-34), with a basic educational level, with regular financial problems, who think vaccination is useless and who doubt becoming vaccinated themselves with the COVID-19 vaccine, and who are dissatisfied with the government's policy towards the corona crisis (all chi-square test p-values <0.001). They were also more likely to think that vaccine allocation should be driven by the preferences of the population instead by those of policy makers or scientists.

3.2. DCE results

In total, we analysed 19,440 choices between hypothetical individuals competing for vaccination. We first estimated model A (see *Table 3* and *Figure 3*) that summarizes the choices made by the whole sample and that can reflect the preferences over the five attributes of the average respondent. This model showed that there was not one single attribute that dominated the other attributes and that gave a subgroup of the population lexical priority over others. Instead, we found that three attributes were of large importance: belonging to a medical risk group, having an 'essential profession' and being a relatively large spreader of the virus. Belonging to a medical risk group was found to be the most important one. While older people are also labelled as higher risk groups with COVID-19, being in an older age group was not found to be a strong predictor of priority to vaccine access by the public. Vaccinating first people who would be costly to the society if they have COVID-19 did not appear to matter either.

When adding all possible first-order interaction effects between the five attributes into model A, we identified a few interactions that were of practical relevance. The combinations of being older than 60 and having an essential profession, having a high cost to society and essential profession, or being part of a medical risk group and being a super-spreader, led to a higher priority to vaccine allocation.

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Table 3: Model estimates for the entire sample and the two clusters

Term	Posterior	Posterior Std	Subject Std Dev	Lower	Upper 95%
		Model A (N=1944)			
Medical risk group					
Yes	0.676**	0.024	0.446	0.632	0.724
No	-0.676**	0.024	0.446	-0.724	-0.632
Older than 60					
Yes	0.093**	0.015	0.442	0.064	0.124
No	-0.093**	0.015	0.442	-0.124	-0.064
Virus spreader					
10 other persons	0.660**	0.024	0.468	0.614	0.708
1 other person	-0.660**	0.024	0.468	-0.708	-0.614
Cost to society					
0 €/day	-0.123*	0.026	0.251	-0.173	-0.078
100 €/day	-0.011*	0.022	0.146	-0.054	0.030
1000 €/day	0.134*	0.027	0.262	0.082	0.187
Essential profession					
Yes	0.567**	0.019	0.519	0.529	0.604
No	-0.567**	0.019	0.519	-0.604	-0.529
		Model B (N=1058)			
Medical risk group					
Yes	0.309**	0.023	0.072	0.265	0.352
No	-0.309**	0.023	0.072	-0.352	-0.265
Older than 60					
Yes	-0.202**	0.017	0.291	-0.236	-0.169
No	0.202**	0.017	0.291	0.169	0.236
Virus spreader					
10 other persons	0.911**	0.032	0.477	0.849	0.973
1 other person	-0.911**	0.032	0.477	-0.973	-0.849
Cost to society					
0 €/day	-0.334**	0.032	0.273	-0.400	-0.275
100 €/day	0.060**	0.029	0.224	0.002	0.114
1000 €/day	0.274**	0.030	0.298	0.213	0.334
Essential profession					
Yes	0.362**	0.020	0.381	0.323	0.402
No	-0.362**	0.020	0.381	-0.402	-0.323
		Model C (N=886)			
Medical risk group					
Yes	1.394**	0.060	0.547	1.276	1.521
No	-1.394**	0.060	0.547	-1.521	-1.276
Older than 60					
Yes	0.504**	0.029	0.438	0.449	0.564
No	-0.504**	0.029	0.438	-0.564	-0.449
Virus spreader					
10 other persons	0.480**	0.037	0.125	0.409	0.562
1 other person	-0.480**	0.037	0.125	-0.562	-0.409
Cost to society					
0 €/day	-0.050	0.033	0.130	-0.119	0.014
100 €/day	0.004	0.039	0.221	-0.071	0.072
1000 €/day	0.046	0.042	0.240	-0.039	0.129
Essential profession					
Yes	0.975**	0.046	0.737	0.886	1.071
No	-0.975**	0.046	0.737	-1.071	-0.886

** Significant at p<0.001, * Significant at p<0.05

Since an overall model based on the average respondent can be misleading in case a population is polarized, we investigated individual differences between respondents and identified two large clusters of respondents within the sample. The preferences of the first cluster (n=1,058, 54% of the sample) are summarized by model B. This cluster was in favour of prioritizing spreaders. The second cluster (n=886 respondents, 46%) is summarized in model C. These respondents prioritized vaccinating medical risk groups. Both clusters valued essential professions as the second most important attribute. Interestingly however, whereas people aged 60 or more were prioritized in cluster 2, they were not prioritized in cluster 1. Cluster 1 also valued people who were economically important whereas this attribute was statistically insignificant in cluster 2. *Figure 3* presents the main utility effects of all the models in predicting respondents' choices.

We analysed whether there were any of individual characteristics associated with membership to clusters 1 or 2. There were no strong profiles emerging. However, compared to those from cluster 1, bivariate analyses showed that respondents belonging to cluster 2 (prioritizing risk groups) were more likely part of a medical risk group for COVID-19, more likely to be working, more convinced of the value of vaccines in general, more likely to become vaccinated with the COVID-19 vaccine, less likely to think that the COVID-19 vaccine allocation strategy needed to be made only by the population, more likely to think that the government should make these decisions, and less likely to be French-speaking (all chi-square test p-values <0.001). When these six factors were analysed jointly in a multivariate regression, the effect of belonging to a risk group or general attitude to vaccination became insignificant whereas the other four characteristics remained. There was no relationship between being a member of cluster 1 or 2 and respondents' age, having an 'essential' profession, financial situation, level of education or other variables in our survey. We found no evidence that respondent choices were driven by self-interest.

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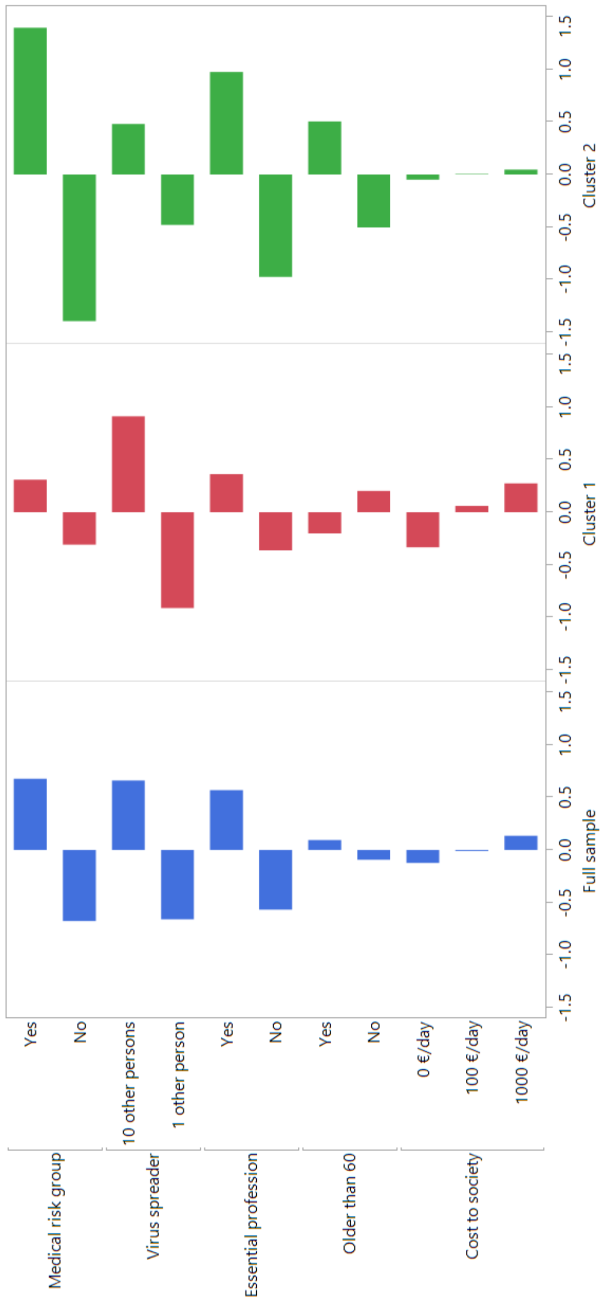
Figure 3: Estimated utilities of the full sample (N=1944 respondents), cluster 1 (N=1058 respondents) and cluster 2 (N=886 respondents)



4. Discussion

This study lays bare clear patterns in how the general public wants to allocate COVID-19 vaccines when available.

First, there is little support for approaches that are more libertarian-inspired such as highest willingness-to-pay or ‘first-come, first served’ strategies. A strict egalitarian approach like a lottery also receives little support. The most supported strategies are those where priority groups are explicitly defined at a policy level.

Second, when deciding which individual characteristics ought to matter to policy makers when ranking priority groups, respondents have a clear preference not to prioritize older aged individuals, even though they belong to higher risk groups for COVID-19. This was true also for respondents from older age groups. This would support the fair innings argument according to which priority should be given to the young over the old and age is an accepted criterion for scarce health care resources allocation under the assumptions that every individual is entitled to live for a reasonable length of life.(Williams and Evans 1997) The general public would not prioritise for vaccination those who are of particular economic importance such as those who work. Instead, they prioritized vulnerable people with medical conditions, people who are instrumentally important to public health by playing a role in wider virus transmission in the population or people who are more important to society functioning such as those with essential professions.

Third, when trying to compare and rank within the three main target groups, the population was divided in two clusters. A share adhered to a ‘utilitarian’ strategy of maximizing societal health outcomes by allocating vaccines strategically towards virus spreaders (cluster one).(Savulescu, Persson, and Wilkinson 2020) These people also thought that vaccinating those with high economic cost to society was to some extent relevant. The other cluster adhered to a ‘prioritarian’ strategy that put those people who are at medical highest risk first (cluster two). Being a virus spreader or someone who could cost a lot to the economy was of little or no importance in this cluster. However, both groups considered essential professions a priority group but of secondary importance. Age was of minor importance in both groups but whereas being older than 60 would receive priority in the ‘prioritarian’ group, in the ‘utilitarian’ group we observed the opposite. It was not the case that membership of these clusters coincided with the interests of the respondents. For instance, there was no relationship between priority choices and being young (respectively old) or with having an essential profession or not. Respondents who were not working (students, retired or unemployed people and homemakers) were more likely to be part of the ‘utilitarian’ cluster one. Those belonging to a risk group were more likely part of the ‘prioritarian’ cluster two, however that effect disappeared when multiple respondent characteristics were considered simultaneously.

What is remarkable is that there were similarities but also discrepancies between the ranking exercise and the DCE. Whereas elderly vaccination was within the top three strategies in the ranking exercise (although the lowest ranked one), in the DCE this attribute was found of minor importance. In the same vein, vaccinating spreaders was only a second-rate strategy in the ranking exercise, however, when we assorted it with concrete figures so that an individual would spread infection to either one or ten other people, this attribute became very important in one of the two clusters.

How relevant are these observed preferences for the current debate? In the first place, we request some caution that, our results are based on experiment that can only be seen as an approximation of how the public thinks about COVID-19 vaccines allocation. Although we did our best to keep the exercise simple, and we did as many validity checks as possible, we cannot know how people would have responded if they had to consider these choices in a discussion format or if more details had been provided (e.g. on the actual sizes of the different priority sub-groups within the society). More fundamentally, while there is almost a consensus on the priority candidates to the COVID-19 vaccines, ranking within those key groups is not straightforward and there is not a consensus of whom should be vaccinated first, second, and so on. The difficulty of defining a clear ranking among the identified priority groups has also been observed in the COVID-19 vaccination strategies put forward by the EC and WHO SAGE expert groups (World Health Organization 2020, European Commission 2020).

Making social trade-offs between health, the economy and the health system is difficult and it is not clear what the exact value of the public opinion has in comparison to the more informed and deliberate judgment of experts and politicians. However, we believe that, in the light of the large collective dimension of the COVID-19 crisis, the preferences of the public opinion are an essential input value to the debate. It is the goal of this study to provide such an evidence base.

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6. Appendix

Table A.1: Sample characteristics

Characteristics	Responses item	N	%
Respondents' general background			
Gender	Female	951	49%
	Male	993	51%
Age	18-24	194	10%
	25-34	330	17%
	35-44	331	17%
	45-54	379	19%
	55-64	321	17%
	65-80	389	20%
Language	Dutch	1112	57%
	French	832	43%
Province	Vlaams-Brabant	191	10%
	Waals-Brabant	129	7%
	Brussels Capital	176	9%
	Antwerpen	288	15%
	Limburg	157	8%
	East Flanders	249	13%
	West Flanders	200	10%
	Hainaut	115	6%
	Liège	186	10%
	Luxembourg	102	5%
	Namur	151	8%
Education	None	7	0%
	Primary school	61	3%
	First degree secondary school	187	10%
	Second degree secondary school	247	13%
	Third degree secondary school	684	35%
	Higher education (non-university)	468	24%
	University or post-university	268	14%
	PhD	14	1%
	Other	8	0%
Have children	Yes	1213	62%
	No	731	38%
Profession	Working	915	47%
	Homemaker	80	4%
	Student	158	8%
	Unemployed	129	7%
	Disabled	127	7%
	Retired	472	24%
	Other	63	3%
Difficulties with monthly expenses	Never	802	41%
	Once a year	422	22%

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	Once every three months	391	20%
	Every month	329	17%
Self-assessed health	Very good	248	14%
	Good	741	41%
	Rather good	602	34%
	Bad	167	9%
	Very bad	22	1%
	Don't know/don't want to say	14	1%
Respondents' Covid-19 related background			
Self-reported membership of a COVID-19 risk group	No	1183	61%
	Yes, elderly	366	19%
	Yes, chronically ill	400	21%
	Yes, severe obesity	124	6%
	Yes, other	68	3%
Self-reported profession is labelled as 'essential'	Yes	367	19%
	No	1577	81%
Has had a COVID-19 infection	Yes, confirmed with a test	57	3%
	Probably, but not confirmed with a	160	8%
	No	1727	89%
Know personally someone who has had COVID-19	Yes, confirmed with a test	293	15%
	Probably, but not confirmed with a	175	9%
	No	1476	76%
Know personally someone who was hospitalized for COVID-19	Yes	118	6%
	No	1826	94%
Know personally someone who died of COVID-19	Yes	83	4%
	No	1861	96%
Satisfaction with government's approach of COVID-19 pandemic	Very satisfied	58	3%
	Rather satisfied	729	38%
	Rather dissatisfied	787	40%
	Very dissatisfied	370	19%

Table A.2: Complete design of the DCE

Survey	Choice	Medical	Older	Virus	Cost to	Essential
1	1	yes	yes	1 other person	0	yes
1	1	no	no	1 other person	1000	yes
1	2	no	yes	10 other persons	100	no
1	2	no	yes	1 other person	1000	yes
1	3	yes	yes	1 other person	0	no
1	3	no	yes	10 other persons	1000	no
1	4	no	yes	1 other person	100	yes
1	4	no	no	10 other persons	100	no
1	5	no	no	1 other person	100	yes
1	5	yes	no	1 other person	1000	no
1	6	no	yes	1 other person	1000	yes
1	6	yes	yes	10 other persons	1000	no
1	7	yes	no	10 other persons	1000	no
1	7	yes	yes	10 other persons	0	yes
1	8	yes	yes	1 other person	100	yes
1	8	yes	no	10 other persons	0	yes
1	9	no	yes	1 other person	0	yes
1	9	yes	no	1 other person	0	no
1	10	yes	no	1 other person	100	no
1	10	no	yes	10 other persons	100	no
2	11	yes	yes	1 other person	100	no
2	11	no	no	1 other person	0	no
2	12	yes	no	1 other person	100	yes
2	12	yes	no	10 other persons	0	no
2	13	yes	no	1 other person	0	yes
2	13	no	no	10 other persons	100	yes
2	14	no	yes	1 other person	0	yes
2	14	no	no	10 other persons	0	no
2	15	yes	no	10 other persons	100	no
2	15	no	no	10 other persons	1000	yes
2	16	yes	yes	1 other person	0	yes
2	16	no	yes	10 other persons	0	no
2	17	no	yes	1 other person	0	no
2	17	no	no	1 other person	100	yes
2	18	no	no	1 other person	1000	no
2	18	no	yes	10 other persons	0	no
2	19	no	no	10 other persons	0	yes
2	19	yes	yes	10 other persons	0	no
2	20	yes	yes	1 other person	1000	no
2	20	no	no	10 other persons	1000	no
3	21	no	no	10 other persons	1000	no
3	21	yes	yes	10 other persons	100	no
3	22	no	yes	1 other person	1000	no
3	22	no	yes	10 other persons	0	yes
3	23	no	no	10 other persons	0	yes
3	23	yes	no	1 other person	1000	yes
3	24	yes	no	1 other person	1000	no
3	24	yes	yes	10 other persons	1000	yes
3	25	yes	yes	10 other persons	100	yes
3	25	no	yes	10 other persons	1000	no
3	26	yes	yes	1 other person	100	no

3	26	no	yes	10 other persons	100	yes
3	27	no	yes	1 other person	100	no
3	27	no	no	1 other person	0	yes
3	28	yes	yes	1 other person	1000	yes
3	28	yes	no	10 other persons	100	yes
3	29	yes	yes	1 other person	100	yes
3	29	no	no	1 other person	100	no
3	30	yes	no	1 other person	1000	yes
3	30	no	yes	10 other persons	1000	yes

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